



# Experiment Hardware

## *SPICE*

### ***Major SPICE Hardware***

- Experiment assembly
- Still & video cameras
- Power conditioning box
- Video titler box
- Controller box
- Power cable
- Twelve fuel bottle assemblies
- Six fuels, 2 each of:
  - methane
  - propane
  - ethylene
  - propylene: 0, 25, & 50% gaseous nitrogen dilutions

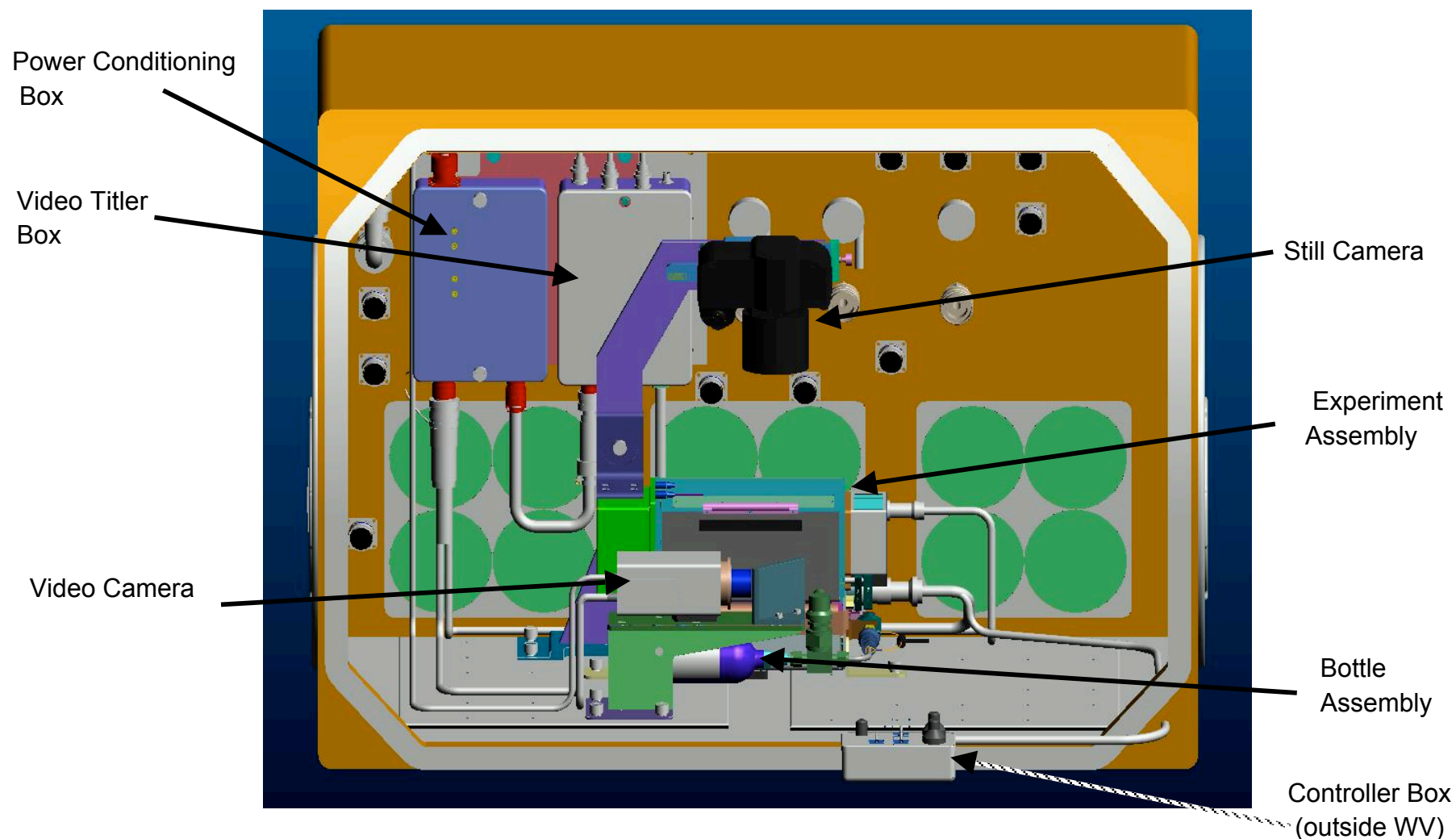


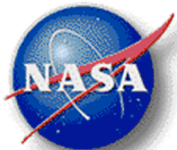
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# Experiment Hardware

## *SPICE*

### *Diagram SPICE Mounted in MSG*

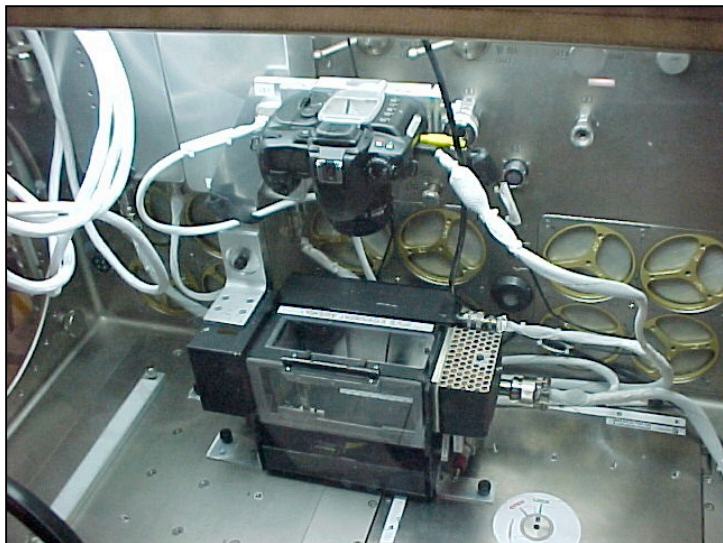




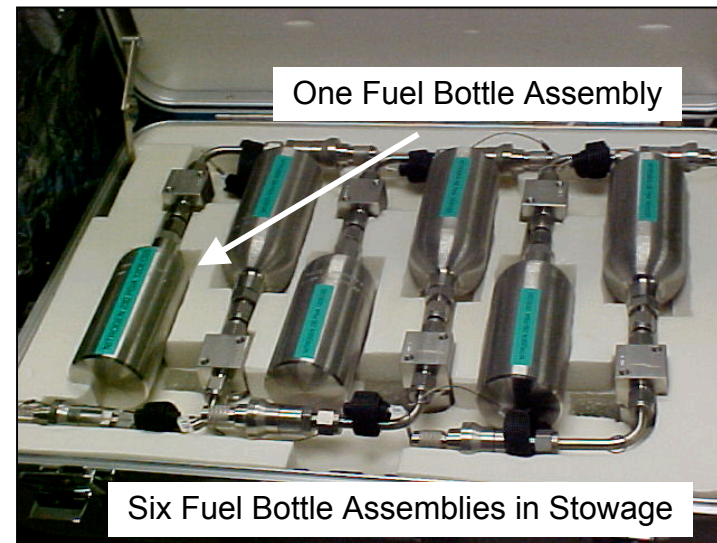
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# Experiment Hardware

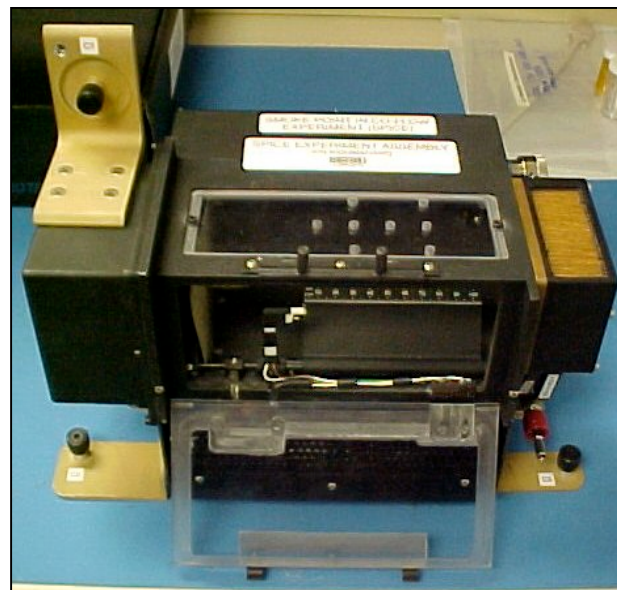
## *SPICE*



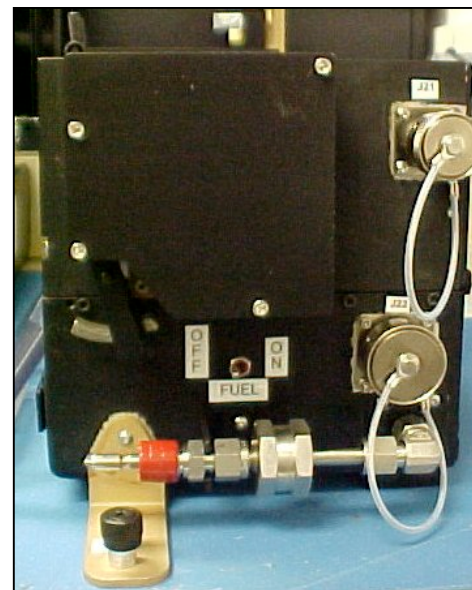
*SPICE Hardware in the MSG*



*SPICE Fuel Bottle Assembly*



*SPICE Experiment Assembly*





# ISS Ops & Resource Requirements

## SPICE

### On-Orbit Operations:

- Install hardware in MSG & power up.
- Crew sets the experiment parameters and enables the data recording via the Control Box external to the MSG WV.
- Crew turns on the fuel flow and ignites the fuel.
- Using the control box the crew sets smoke point, the radiometer gain and snaps 3 pictures.
- Crew will then disable fuel flow, stop data recording and disable the ignitor.
- Crew will turn off the fuel flow and run MSG air circulation.
- Crew replaces the Micro Drive, Fuel Bottle Assembly or set up for the next test as necessary.

	SPICE Experiment Assembly, Still Camera Stand, Power/Video Unit, two Fuel stowage cases containing 12 Gas Supply Assemblies Hardware and a Component Stowage Case with Control Box, Video Camera and mount, Digital Still Camera, six Ignitor assemblies, three different diameter burning tubes, and cables.	
Facility	COLUMBUS/Microgravity Science Glovebox (MSG)	
Late access	N/A TBD	
Pre-flight	N/A	
In-flight: # of sessions	TBD # of sessions –	Experiment duration estimate 25 hours; all attended by crew
Post-flight	N/A	
Early Retrieval	N/A	
Target Subjects	N/A (Crew as operator only)	
Total # of Subjects Required	Short-term	N/A
	Long-term	N/A
Total # of Subjects collected so far	Short-term	N/A
	Long-term	N/A
Ground reference	No	



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# Increment 18 Scenario

## SPICE

	Description	Attended (hours)	Unattended (hours)
Activity 1	SPICE Set-up in MSG	3.17	--
Activity 2	Repeat test sequence for 6 fuels	6 x 3.33	--
Activity 3	Disassemble and stow SPICE	1.42	--
	Total Crew Time	24.58	--

Mass Up            38.3 kg  
Mass Down        38.3 kg

All SPICE hardware & gas sample bottles  
All SPICE hardware & gas sample bottles





# Issues/Concerns/Progress Flight *SPICE*

- Can reduce mass significantly if go with only one set of gas sample bottles. Would enhance manifest probability, since up-mass is a liability. Concern if retain enough gas in bottles (some will be lost to very, very slow leakage) to perform experiment. Late stowage would reduce concern.
- SPICE Will Be Ready to Fly on Progress
  - opportunity to fly earlier than ULF-2
  - further hardware testing, e.g. vibration
  - thermal environment more severe +/- 50 deg. C
  - require mods to both ground & flight safety packages
  - require mods to verifications, other documentation
  - different logistics